

# LAV Project

Management & Communication  
Document

**Elijah Relf** : s3564403

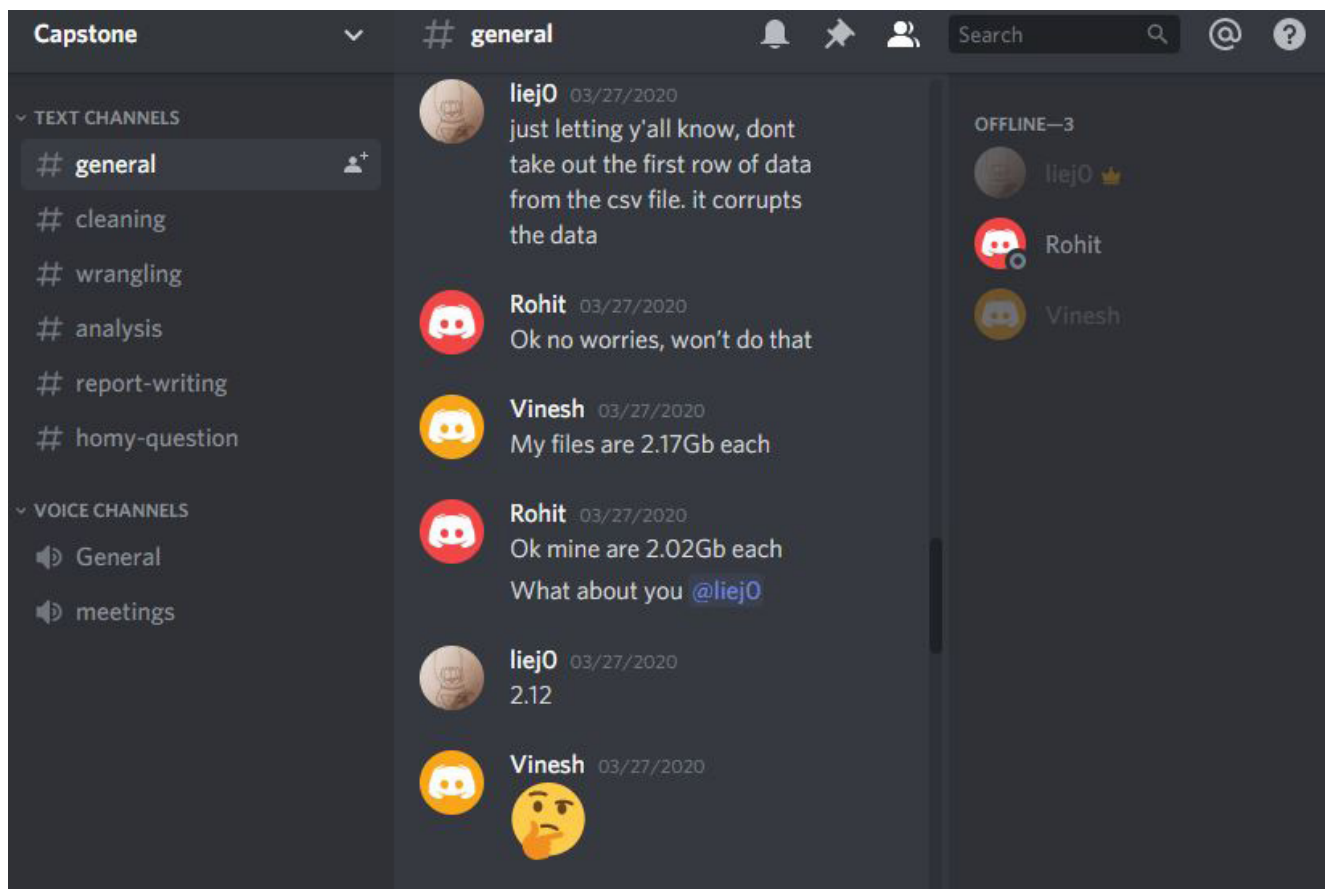
**Vinesh Singh Gobin** : s3670123

**Rohit Menon** : s3544222

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# Screenshots of Daily Communication



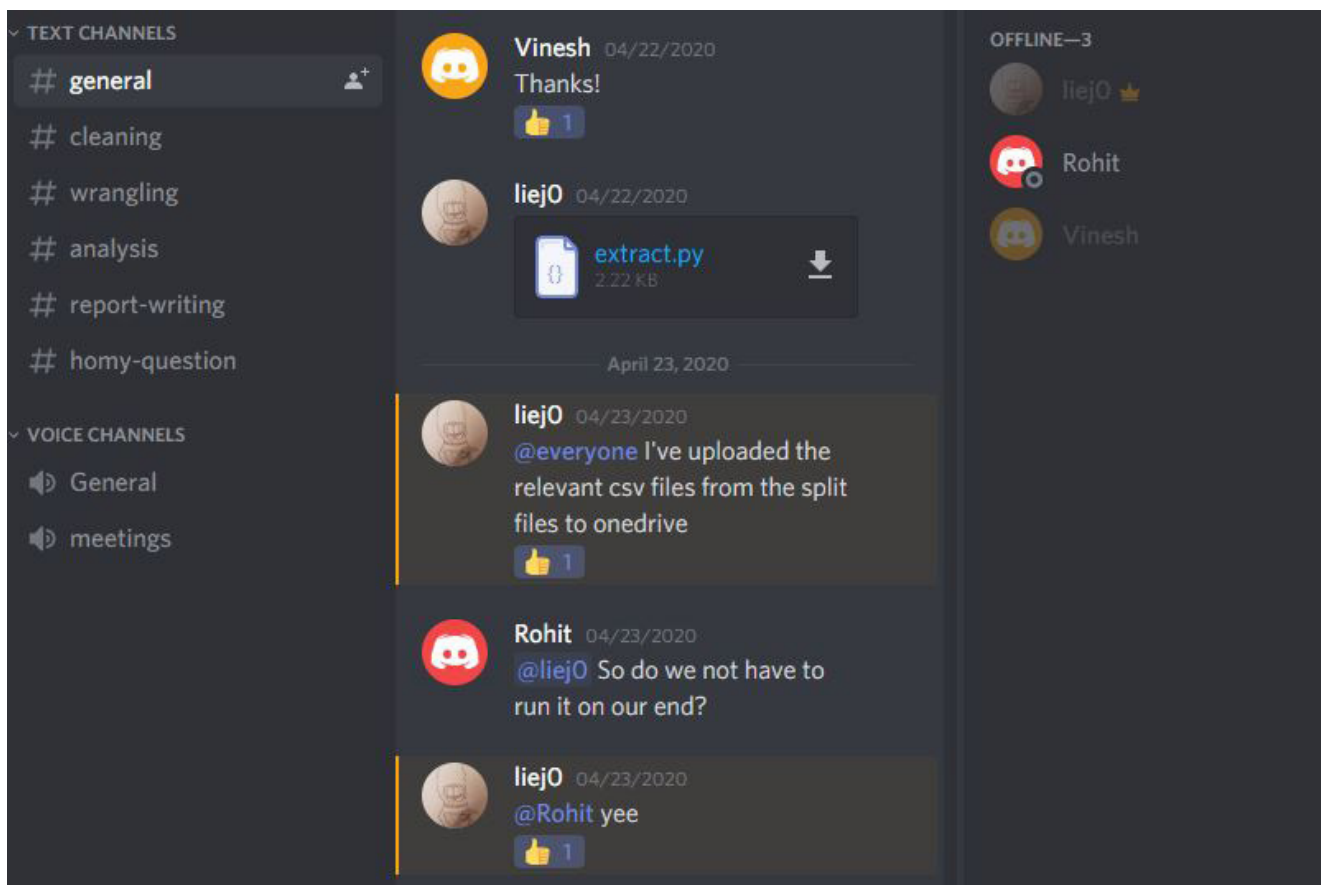
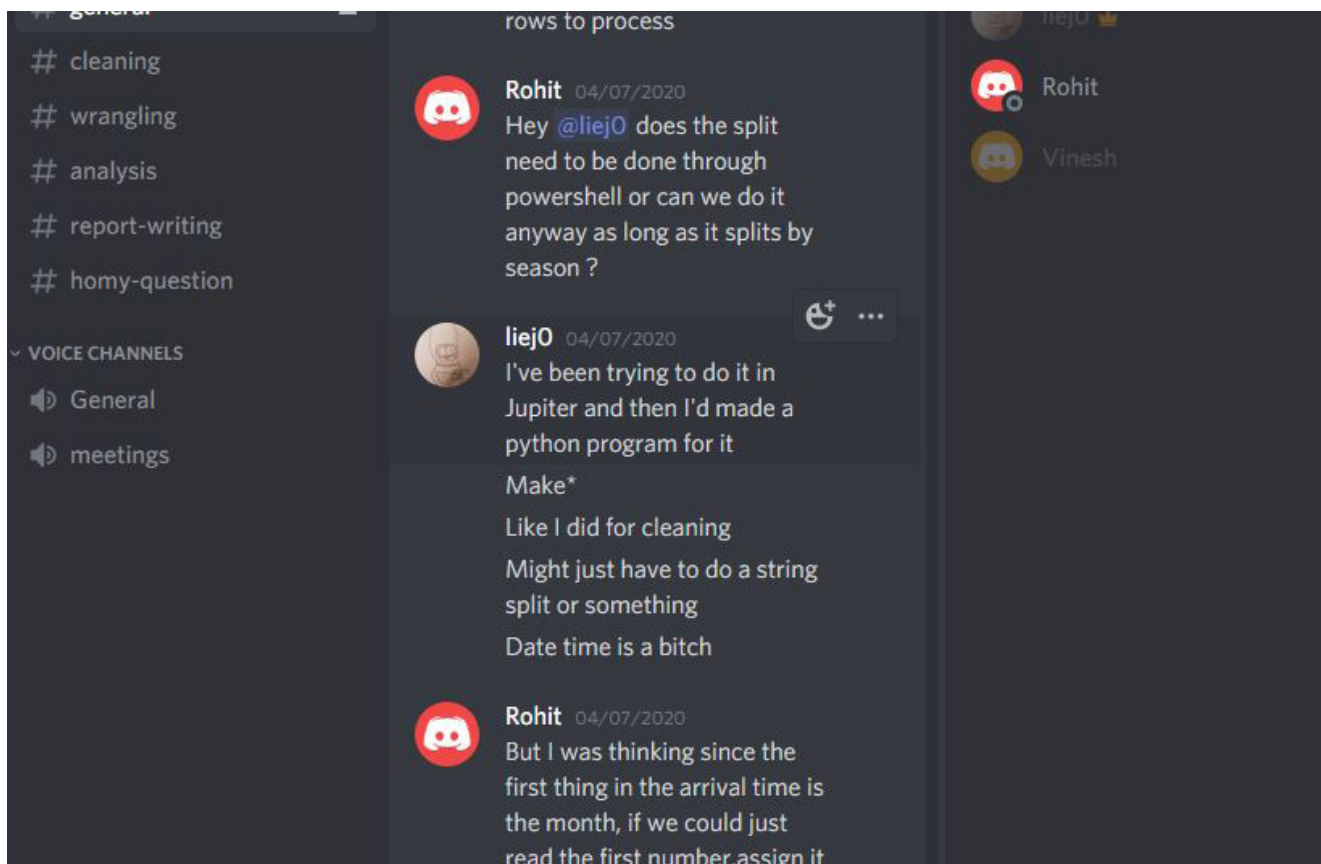
## Discord used as the primary app for our daily communication

For our LAV project, the majority of our communication took place on discord and turned out to be extremely effective, we setup our discord environment at the very beginning to include 5 different channels for the different parts of the project we were working on, including a general channel where we could talk and discuss about more general topics and queries.

Our group's communication was excellent throughout the whole duration of the project, it was something that we agreed to keep up with since group formation, and we were able to keep the consistency and have daily communications on the app.

As can be seen by the screenshot above, we also used it to help each other solve queries and to check with each other on a daily basis to ensure consistency and transparency within our group. This really played a massive part in keeping us all in sync.

# Screenshots of Daily Communication (Continued)



# Meeting: #1

## Week: 2

<b>Date:</b>	11/03/2020
<b>Time:</b>	8:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Building 8 - LVL 11 - 66
<b>Attendees:</b>	Elijah, Ali, Vinesh
<b>Apologies:</b>	Rohit
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Full dataset is not accessible	We may Need to find an alternative public dataset that provides similar or variables to the inaccessible one.  Ask Homy for suggestions and permission to use new dataset instead	Looked through city of Melbourne's Open Data website and shortlisted 3 different dataset options before finalising and selecting the most suitable one.	All
2	Kanban Board approach	Our project would be better managed and implemented using the Kanban method instead as suggested by Homy	Change Clickup's view and set tasks as: <ul style="list-style-type: none"> <li>To Do</li> <li>In Progress</li> <li>Done</li> </ul> With each task being assigned to its respective team members	Elijah
3	Draft Charter and plan for the following week	Compare each member's availability for the next meeting, to choose an appropriate time that suits all.	Individual Tasks created for the project charter and assigned to members	All
4	New Team Member: Vinesh	Welcomed into the team. Quick run through of what was discussed in week 1 and what issues we faced and resolved	Vinesh joined the different communication and project management tools (ie: Clickup, Onedrive, Discord)	Vinesh

# Meeting: #2

## Week: 2

<b>Date:</b>	13/03/2020
<b>Time:</b>	1:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Building 8 - LVL 11 - 66
<b>Attendees:</b>	Elijah, Ali, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	RMIT classes to go online due to covid19	How can we best work and collaborate on the project if this does occur and what platform would be most suitable for participating in team meetings.	Created accounts for Zoom Video Conferencing	All
2	Original Dataset alternative changed	Originally selected Dataset seems to be too generic and might not be very useful when visualising and reporting on the data in the weeks to come.	Selected another dataset from City of Melbourne's Open data: On-street Car Parking Sensor Data-2016	All
3	More than 30 Million rows of data	How should the team go about cleaning such a large amount of data. Would it be better if one person cleans the data or if it's divided into four parts for each team member to clean?	Splitting the cleaning of the data might be better but will check with Homy next week to see if we need to use all the rows or if we can take and use a portion of the data.	All

# Meeting: #3

## Week: 3

<b>Date:</b>	18/03/2020
<b>Time:</b>	8:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Building 13–LVL 02
<b>Attendees:</b>	Elijah, Ali, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Dataset used should be the latest one	Since data from 2017 is the latest version available for the data that we are using, it would make sense to use this dataset instead for our project.	Switched project to the City of Melbourne's <u><i>On-street Car Parking Sensor Data – 2017</i></u>	All
2	35 Million rows of Data	As per suggestion from Homy, since it's all from the same year, we do need to use all data, but maybe it could be divided by seasons.	None as of now.	All
3	Data Cleaning and wrangling	How should we go about cleaning the data and performing data wrangling in the upcoming weeks, especially as not all team members may not know how to best do this. Datacamp offers free lessons on various data science topics so this could be extremely useful throughout the duration of our project	Accounts on data camp created to learn about how to best clean and wrangle data	All
4	OSEMN Model	Elijah's suggestion to use the OSEMN model makes sense for our project, which is to obtain, scrub, explore, model and interpret the data	ClickUp tasks arranged to work with this methodology.	Elijah

# Meeting: #4

## Week: 3

<b>Date:</b>	20/03/2020
<b>Time:</b>	1:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Online Using Discord
<b>Attendees:</b>	Elijah, Ali, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Charter Content	Entire team's collaboration on Project charter and preparing documents into OneDrive – ready for submission on Monday the following week.	All submission files looked over and prepared to be submitted.	All
2	Maximum length for charter	Team works on submission files together to ensure what is not necessary is not included	Repeated sentences and extra unnecessary information minimised.	All



# Meeting: #5

## Week: 4

<b>Date:</b>	25/03/2020
<b>Time:</b>	8:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Online Using Discord & Microsoft teams
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Write tasks as user stories	Our current tasks on clickup look more like a to do list, this is fine but we need to write them as if it were a user story	Write tasks in the format "I want to do this, so that I may be able to assist team with this." This is the correct format which is to be used from now on.	All
2	More Detailed Clickup	We need to be more specific with clickup and also have more tasks created for each activity we will be undertaking	Tasks will be modified to include more detail within them	Elijah
3	Different tools for processes	What are the different tools we will use for the different stages of our analysis project, which are the best tools and what's most popular in this industry	Find out a methodology that is widely used in this field, so that we may be able to decide on one moving forward	Vinesh Rohit

# Meeting: #6

## Week: 4

<b>Date:</b>	27/03/2020
<b>Time:</b>	1:30 PM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Online Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Splitting Spreadet	Unable to upload the split dataset spreadsheets as they are too large. It may be better to share script and run individually	Everyone individually run the script so they may get the data	All
2	Assigning split files to everyone	Run the python scripts indivually as assigned and compare data count at the end to see if it happened completely and correctly	Elijah runs 1st Vinesh runs 2nd Rohit runs 3rd	All

# Meeting: #7

## Week: 5

<b>Date:</b>	1/04/2020
<b>Time:</b>	10:30 AM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Microsoft teams, Discord.
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Data cleaning	The best way to go about it would probably be to create a function that gets passed through the chunks of data to clean them. If this works all that would be required is to run each program individually then merge the cleaned files together	Create a python program the cleans the data from each of the split files	Elijah
2	Null values	In analysis, there are different approaches on dealing with null values, we can either normalise them or drop those rows altogether.	Let's do some research over the next 2 days to look at what would be a suitable approach for our project and then come to a decision about this in our next group meeting.	Vinesh Rohit

# Meeting: #8

## Week: 5

<b>Date:</b>	3/04/2020
<b>Time:</b>	12:30
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Discord.
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Null Values	<p>In analysis, we can either normalise them or drop those rows altogether.</p> <p>But its best with our approach and the questions we are looking to answer to just drop the null rows rather than normalising it.</p>	Write function in our python program to drop all rows with null values	Elijah
2	Data wrangling	<p>We need to begin data wrangling.</p> <p>It would also be best if instead of all three of us working on data wrangling, Elijah and Rohit can work on the wrangling and Vinesh can work on Machine learning</p>	Elijah and Rohit to proceed with Data Wrangling	Elijah Rohit
3	Machine Learning Techniques	With machine learning Vinesh can work on some techniques for the data. Training and testing data can be made to start getting some predictions going.	Vinesh to proceed with using machine learning techniques to form predictions	Vinesh

# Meeting: #9

## Week: 6

<b>Date:</b>	8/04/2020
<b>Time:</b>	10:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Microsoft teams, Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Visualisation progress	<p>We need to begin the visualisation relatively soon. Other LAV groups are already on visualisation.</p> <p>If our data wrangling approach is taking too long because of the millions of rows, we should try another approach so that we may start visualizing the data soon.</p>	Try the program to split all files etc, if it takes too long, we can look at using smaller randomised samples and later check to see if there's any disparity	Elijah
2	Clickup problem	Clickup has all these other boards and is no longer loading our boards correctly – We need to see what happened and if we should just switch to another tool similar to Clickup(maybe Asana) – which uses the Kanban approach also.	Check what's wrong and try to create a new board with all the tasks assigned to one member at most, subtasks to be used where two or members are on a similar parent task.	Vinesh Rohit

# Meeting: #10

## Week: 6

<b>Date:</b>	10/04/2020
<b>Time:</b>	12:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Split By season	We need to split by season as suggested by Homy, and then we can later compare the differences in data for different seasons.	Add functionality to wrangling program to split  According to season.	Elijah Rohit

# Meeting: #11

## Week: 7

<b>Date:</b>	22/04/2020
<b>Time:</b>	10:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Microsoft teams, Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Program takes too long to run	It might be better to have 3 smaller samples and then have a comparison of these samples to see if they are similar and check to make sure there is no disparity between them	Split into smaller CVSs with parts taken from the start, middle and end as suggested by Homy	Elijah

# Meeting: #12

## Week: 7

<b>Date:</b>	24/04/2020
<b>Time:</b>	12:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Microsoft teams, Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Meeting Minutes formatting fix up	Meeting minutes are in different templates and we must ensure consistency here especially for the final submission	Fix up meeting minutes and put them into same template	Rohit
2	Same kind of data to compare and merge	We must check that the answers we are trying to get using data visualisations are in the scope of our initial questions formed	The data is to be visualised individually for now and we can compare our visualisations next week and decide on how we should proceed	Elijah Vinesh Rohit



# Meeting: #13

## Week: 8

<b>Date:</b>	29/04/2020
<b>Time:</b>	10:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Microsoft teams, Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Do we need to use 3 sample sets?	If all our sample sets being analysed are randomly selected, then can we merge them to form one large sample that is also random and use that instead	It depends on the approach we use, there is no standard right way	Rohit
2	Timesheets need to be filled in	Timesheets are incomplete and need to be filled in and up to date	Everyone needs to fill in timesheets and update this week	Vinesh Elijah Rohit
3	Status Report	Every 2 weeks a status report is required of where we are at, next actions and progress made so far, which needs to be shown to Homy to get feedback earlier than later.	Report needs to be started this week detailing progress and what's next	Vinesh Elijah Rohit
4	Scatter Matrix for Sample comparisons	For analysing the sample sizes, it might be easier to just create a scatter matrix for each and then compare them	Let's have a go individually and compare what visualisations work best to answer the initial questions we formed for the data	Elijah

# Meeting: #14

## Week: 8

<b>Date:</b>	2/05/2020
<b>Time:</b>	12:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Too many smaller samples	It would be better to merge the 3 smaller samples(ie the top, middle and bottom) into one, so that we have 3 total samples between the three of us	Merge those 3 sub samples together using excel copy and paste	Elijah
2	Sample Comparison / begin report	We should start analysing the three samples and must begin our report to show Homy to get feedback this coming week	3 samples are analysed together using Scatter Matrix	Elijah
3	Visualisation Plots & Formatting	Plots need to be made for the sample that best answer the questions we wish to answer with the data, we also should format it well into a presentable format that is easy to read through	Create visualisation plots and this same code can be used on our larger sample at a later point. Share this code on discord	Vinesh
4	Visualisation Plots & Formatting	Plots need to be made for the sample that best answer the questions we wish to answer with the data, we also should format it well into a presentable format that is easy to read through	Create visualisation plots and this same code can be used on our larger sample at a later point. Share this code on discord	Elijah

# Meeting: #15

## Week: 9

<b>Date:</b>	6/05/2020
<b>Time:</b>	10:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Microsoft teams, Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Tableau tool for visualisation	This tool suggested by Homy is one of the best tools for data analysis used in the industry and having experience in using the tool is great for having down on our resumes, if we will be looking for graduate jobs in this industry	Sign up to tableau using rmit student account and give it a try when visualising the data, instead of using anaconda Jupyter.	Elijah Vinesh Rohit
2	Timesheet	We all need to make sure our timesheets are updated and formatted properly and Homy would like to see this completed in the coming week	Each member to update timesheets on onedrive, so that its up to date and ready, also need to ensure it is updated whenever we work on the project	Vinesh Rohit Elijah
3	Clickup	Clickup needs to be set correctly, with tasks assigned a due date and status such as in progress or done.	Tasks to be set a due date and status updated for each task almost every day.	Elijah

# Meeting: #16

## Week: 9

<b>Date:</b>	8/05/2020
<b>Time:</b>	12:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Visualisations	We need to learn this tool in more depth to understand how to make the most out of it, at the moment our visualisations are not the best they could be	Look through tutorials on lynda and youtube on how to use the filters and make the plots more appealing	Vinesh Rohit
2	Data source	Is there a way to change the data source while still keeping the same plot settings, this way we can create the plots and switch the datasets according to the season we want to be analysing	Find out how to switch the data source in tableay without losing the plots and connections	Vinesh

# Meeting: #17

## Week: 10

<b>Date:</b>	13/05/2020
<b>Time:</b>	10:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Microsoft teams, Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Clickup	Tasks need to be more specific and detailed and subtasks are missing on some shared tasks.	Assign each subtask correctly and tasks created with more info and detail	Elijah
2	Final Submission	We need to start putting all the files together for the management, communication and presentation report.	Format all files with the same style, keeping it consistent and making sure everything is done as per specifications for the LAV project	Rohit
3	Final Submission	All code created in python before moving over to tableau must also be included in the final submission for Homy to see	Gather all code from Jupyter notebooks and other data cleaning python programs written and group together to submit with final submission	Vinesh

# Meeting: #18

## Week: 10

<b>Date:</b>	15/05/2020
<b>Time:</b>	1:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Microsoft teams, Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Report	Final report structure and content needs to be ready according to spec sheet, and all images attached	Begin for this week and Have finalised over the next week	Elijah
2	Visualisations	Lets get some more visualisations done, that can add value to our final suggestions by focusing more specifcly at the top 3 Streets and Areas	Create Visualisations on Tableau according to discussion and label and filter color of the plots according to area and street names	Vinesh Rohit

# Meeting: #19

## Week: 11

<b>Date:</b>	20/05/2020
<b>Time:</b>	8:30 AM
<b>Duration:</b>	2 Hrs
<b>Venue:</b>	Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Presentation	We need to begin creating and practicing for the presentation for next week, we need to show our findings as well as share our retrospective on how things went	Create 10 slides – with summary of findings from our report, our data cleaning process and retrospective information	All
2	Report	We need to correct some of the visualisations that are labelled and filtered by colour – at the moment its showing the the non violation count too, which is not needed,	Filter and remove the non violations and label by colour, only showing the violation count instead.	Vinesh

# Meeting: #20

## Week: 11

<b>Date:</b>	22/05/2020
<b>Time:</b>	4:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Presentation	We have to finish slides for the final presentation next week - We also have to make sure we stick to 9 Minutes.	Finish all slides and each group members part doesnt go over 3 minutes	All
2	Management, Communication and Presentation Report	We need to include timesheets with this report, so all group members to ensure that timesheets are up to date and online.	Update Timesheets and upload to onedrive	Elijah Vinesh Rohit



# Meeting: #21

## Week: 12

<b>Date:</b>	24/05/2020
<b>Time:</b>	4:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Presentation	We need to choose order of speaking and choose what data we want to share as we cannot share all information	Keep all the important Data in presentation along with suggestions and remove Extra data that doesn't need to be on the slides	Vinesh Elijah
2	Tableau plots visuals	We need to remove tableau plot backgrounds as they don't match with our slides	Remove Backgrounds with photoshop	Rohit

# Meeting: #22

## Week: 12

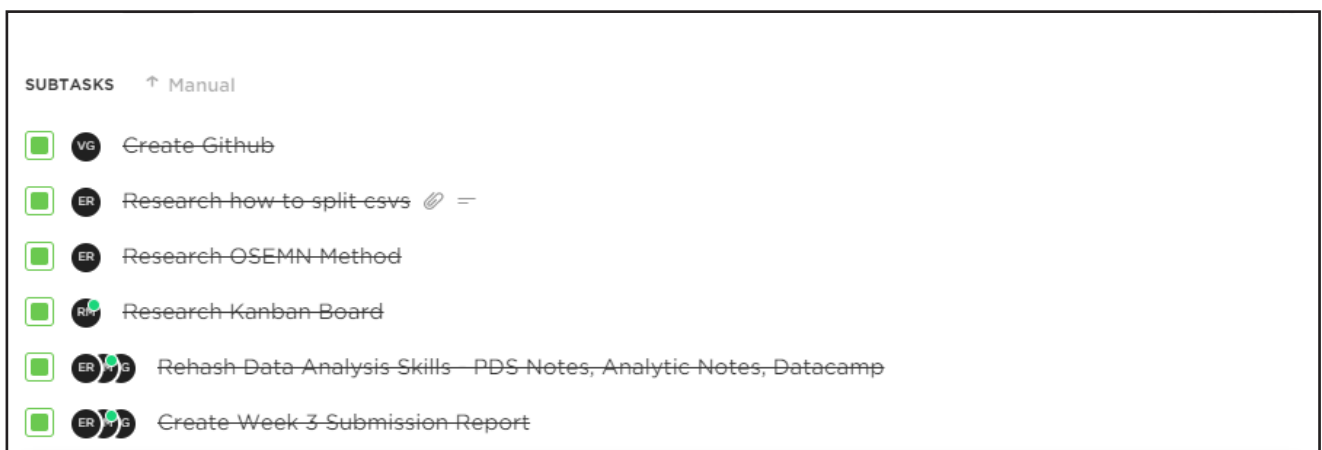
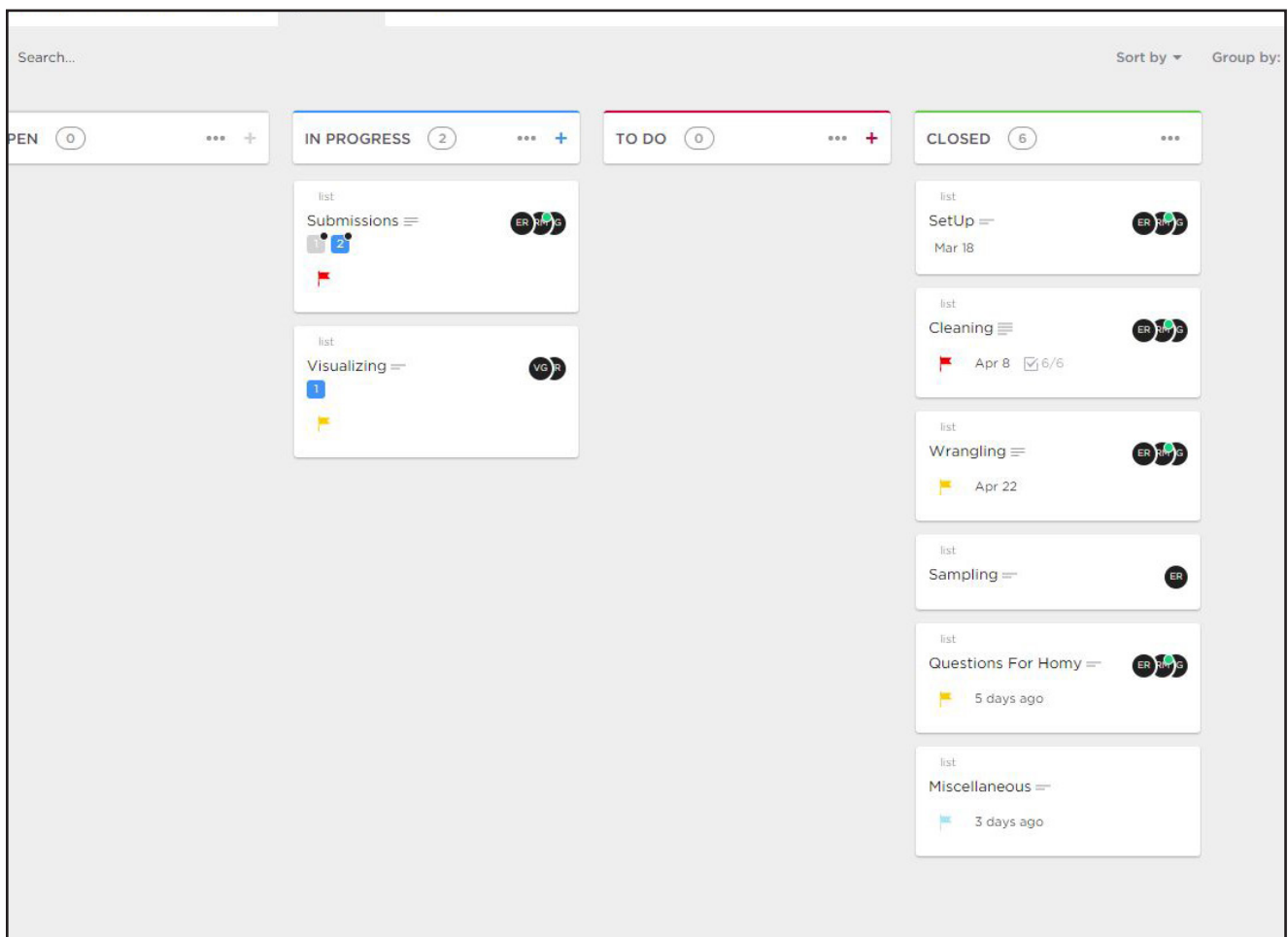
<b>Date:</b>	26/05/2020
<b>Time:</b>	12:30 PM
<b>Duration:</b>	1 Hrs
<b>Venue:</b>	Discord
<b>Attendees:</b>	Elijah, Vinesh, Rohit
<b>Apologies:</b>	
<b>Copy To:</b>	Homy

No.	Topic/Issue	Discussion	Action	Member(s)
1	Presentation	We need to Finalise everything for the presentation and run thorough a couple of times for tomorrow.	Go through all slides and practice over to ensure it goes perfectly smooth tomorrow	Vinesh Elijah Rohit
2	Report	We need to finalise report, wil forms, and make sure all plots are present and correct for the final submission	Check through report and format so that it looks presentable too	Elijah Vinesh
3	Management Communication Presentation Report	We have to make sure that all items required for submission in this spec sheet are in a zip folder according to the submission instructions	Combine everything together and make it presentable for submission	Rohit

# Clickup Screenshots

## Clickup Screenshots

All the task management for our project was done using clickup, we had a board overview that we kept really simple, and upon going into each task area,, there were more detailed and member specific tasks and subtasks that were assigned with due dates.



# Clickup Screenshots (Continued)

As a team member, I want to learn how to split and wrangle data so that I can help my team with the project

Description or type `/f` for commands

Vinesh Govin created this task

> 2 more updates

Vinesh Govin set the due date to Mar 27

Elijah Reif changed status from In Progress to Complete

Mar 25 at 11:31 am

Mar 25 at 11:32 am

Apr 8 at 9:58 am

CLOSED

ER

PM

GO

Share

...

CREATED  
May 6, 11:41 am

DUE DATE  
Mar 18

Setup

Setting up the project

To Do 

Add

SUBTASKS 

Manual

Create-Github

Research-how-to-split-csvs

Research-OSEMN-Method

Research-Kanban-Board

Rehash-Data-Analysis-Skills—PDS-Notes-Analytic-Notes-Datacamp

Create-Week-3-Submission-Report

New Subtask

HIDE COMPLETED

+ ADD CHECKLIST

Attachments 

Add

Drop files here to attach or [browse](#)

Elijah Reif created this task

> 12 more updates

Elijah Reif changed status from In Progress to Closed

Elijah Reif created subtask: Research how to split csvs

May 6 at 11:41 am

May 6 at 11:59 am

May 6 at 12:02 pm

Wrangling

Best way to split data?

- seasonal

Too much data, where to split?

- 10,000 rows at the start, middle and end with the csv split files

To Do 

Add

SUBTASKS 

Manual

Split-the-cleaned-csv-into-3-separate-csvs

create-python-program-that-extracts-the-month-and-assigns-them-to-seasonal-csvs

Elijah Reif created this task

> 6 more updates

Elijah Reif created subtask: create python program that extracts them to seasonal csvs

Elijah Reif changed status from In Progress to Closed

# Analysis of Ethical Considerations

## (Criteria: 4, 6, 8, 10, 12)

### **The Enhancement of Quality of Life (Criteria 4)**

We recognise and believe that our findings will increase the quality of life for a large number of vehicle commuters in Melbourne, who are daily users of parking locations here. The findings and proposals we share could allow more parking locations to be built and developed across the city and can set forth changes to parking signs and their time durations. If such development does occur, we understand that some people might be affected because of the development of the parking areas mentioned above.

### **Honesty (Criteria 6)**

All tasks undertaken in this project have been performed with utmost honesty and professionalism. All ideas and suggestions made have been put forth based on all the evidence we found and patterns we noticed throughout the duration of this project. The dataset used to analyse is public, authentic and provided by the City Of Melbourne. All our findings are based on this dataset.

### **Competence (Criteria 8)**

We take responsibility for this LAV project and all deliverables we provided. These have all been created and maintained with care. All ideas and ' suggestions that we mention throughout our findings have also been looked over to ensure they are valid suggestions. Our visual plots and approach are used widely in this industry, especially the tool we use to plot (Tableau) which is widely used and praised in this space

### **Professional Development (Criteria 10)**

All members of our group were pushed and challenged to learn new aspects of data analysis while continuously upgrading on previously learnt skills.

### **Professionalism (Criteria 12)**

All our findings are presented in an informative way, without any bias. We have only presented on findings we found while analysing the parking data for Melbourne.

# Analysis of Learning Outcomes

## **Creative Thinking (Criteria: 2, 3, 4, 5, 6 Applies)**

Our group really embraced creative thinking. Right from the beginning of the project, we explored different options taking a very creative approach, from the questions that we were looking to solve all the way up to the final data we had to present in order to back up and support our findings.

We embraced risks with our approach by really deciding to overdeliver. Although there were some things that went beyond the scope of the project, we decided to incorporate them to really overdeliver and “hit it out of the park”. Over the duration of this project, we came across many different challenges and problems especially because we were dealing with such large amounts of data. But we embraced these challenges and came up with very logical and realistic steps on how to most effectively deal with the hurdle in order to be able to move to the next task, without over delaying the duration of our current task. We formed unique hypothesis questions, so that we can find patterns in our parking data and try establish a connection with the data and public events in certain areas.

## **Critical Thinking (Criteria: 2, 3, 4, 6 Applies)**

Some issues we faced included:

- Large dataset (35 million rows) – Initial python scripts written for cleaning and wrangling would take 8-10 hrs, and errors would often show up 2 to 3 hours into running the program.
- Plotting on jupyter would take a long time and learning how to plot
- extremely detailed plots that was visually appealing was difficult and
- challenging.

We solved these issues by first decreasing the size of the data we were analysing, we dropped all rows that had information missing and decided to split the data according to seasons which we could later compare alongside our initial hypothesis questions.

We used Tableau as an alternative to jupyter for plotting, and had much better success with plotting the kind of graphs we wanted that were detailed, and easy to read and look through while maintaining all the information we wanted to highlight in the plots.

# Analysis of Learning Outcomes

## **Problem Solving (Criteria: 2, 3, 4, 6 Applies)**

One of the primary problems we faced was that of the data being too large to wrangle, clean and then plot on, the computing resources and time required to analyse and work with such large data, was well beyond the scope of our project. We decided the best way to continue with such large data would be to use random samples according to individual seasons and then analyse these samples with each other to predict for the whole. We use this random sampling process to conduct an analysis for the larger Data.

## **Responsibility (Criteria: 2, 4, 5, 6, 9, 1, 14, 16 Applies)**

All members in the group contributed throughout the project, and were actively involved in the different tasks involved within the project. Whenever any member of our group faced any issues or challenges, every other member was actively involved in helping to overcome and find a solution the problem. Each member performed their assigned task exceptionally well and we were all proactive with the upcoming tasks we had, often looking ahead to see what we can do and learn to be ready for the next task and not have any delays. We also had our own personal goals that we wanted to achieve for the project, these goals were both as a group combined as well as individually. Looking back at the duration of the project in a retrospective meeting, we agreed that all of us achieved in whole or close to whole, the goals and targets we had set out for ourselves. We conducted all tasks, with utmost care and with high commitment and obligation. We wanted to ensure our success with our findings by making sure we all performed in a professional manner and ethically while being aware of our actions and our assigned duties. We faced a number of challenges throughout, and as students we focused on learning through these challenges to become better informed and have more clarity at the end.

## **Team Work (Criteria: 2, 3, 4, 5, 6 Applies)**

Our group was consistent with team meetings, and we never had any issues whatsoever related to the team's environment and dynamic. Each member of our team shared ideas, that added value to our project and played a massive part in creating a supportive team climate. Each member was very respectful with others in the team and provided assistance as much as needed. Our group was extremely transparent in communication so every group member knew about what the other members were doing, including challenges and issues which could then be addressed as a team if needed.